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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,771	01/14/2004	Zheng Yuan	007443/P2	5494
57385	7590	01/23/2006	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW LLP / AMAT			BREWSTER, WILLIAM M	
TWO EMBARCADERO CENTER			ART UNIT	
EIGHTH FLOOR			PAPER NUMBER	
SAN FRANCISCO, CA 94111-3834			2823	

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/757,771

Applicant(s)

YUAN ET AL.

Examiner

William M. Brewster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-13,17-20 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 and 8 is/are allowed.
- 6) ☒ Claim(s) 9-13,17-20 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9-13, 17, 19, 20, 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Jang et al., US Patent No. 6,239,002 B1.

Jang anticipates limitations from claim 9. a method of forming a silicon oxide layer on a substrate, comprising:  
in fig. 2, providing a flow of a silicon-containing processing gas to a chamber housing the substrate 10;  
providing a flow of an oxidizing processing gas to the chamber, col. 7, lines 10-63;  
causing a reaction between the silicon-containing processing gas and the oxidizing processing gas to form a silicon oxide layer 16; and  
in fig. 3. heating the substrate in the presence of nitrous oxide 18 to a temperature greater than or equal to 1000°C in a rapid thermal process for a duration greater than or equal to 1 minute, col. 8, lines 12-33;

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limitations from claim 10, the method of claim 9, wherein:

providing a flow of a silicon-containing processing gas comprises providing a flow of tetraethylorthosilicate (TEOS); and

providing a flow of an oxidizing processing gas comprises providing a flow of ozone, col. 7, lines 52-63;

limitations from claim 11, the method of claim 9, wherein causing a reaction between the silicon-containing processing gas and the oxidizing gas comprises regulating the pressure of the chamber to sub-atmospheric levels, col. 7, lines 10-51;

limitations from claim 12, the method of claim 11, wherein the sub-atmospheric levels comprise pressures in a range from about 200 torr to less than about 760 torr, col. 7, lines 10-51;

limitations from claim 13, the method of claim 9, wherein causing a reaction between the silicon-containing processing gas and the oxidizing processing gas comprises regulating the temperature of the chamber to a range from about 400°C to about 570°C, col. 7, lines 52-63;

limitations from claim 17, a method of forming a silicon oxide layer on a substrate, comprising:

in fig. 2, providing a flow of a silicon-containing processing gas to a chamber housing the substrate 10, col. 7, lines 10-63;

providing a flow of ozone to the chamber, col. 7, lines 51-63; ;

causing a reaction between the silicon-containing processing gas and the ozone to

form a silicon oxide layer 16; and

in fig. 3, heating the substrate 18 in the presence of nitrous oxide in a furnace to a temperature in the range from about 750°C to about 1000°C, col. 8, lines 12-33.

While Jang does not use the term 'furnace', Jang inherently contains the use as the Merriam-Webster Online dictionary defines 'furnace' as: "an enclosed structure in which heat is produced." Since Jang uses an enclosed chamber with heat as evidenced above, the 'furnace' limitation is met.

Jang further anticipates:

limitations from claim 19, the method of claim 17, wherein the silicon-containing processing gas comprises tetraethyloeoasilicate (TEOS), col. 7, lines 52-63;

limitations from claim 20, a method of forming a silicon oxide layer on a substrate, comprising:

in fig. 2, providing a flow of tetraethylorthosilicate (TEOS) processing gas to a chamber housing the substrate 10

providing a flow of ozone to the chamber, col. 7, lines 52-63;

regulating the pressure of the chamber to a pressure in a range from about 200 torr to less than about 760 torr, col. 7, lines 10-50;

causing a reaction between the TEOS and the ozone to form a silicon oxide layer 16 and

in fig. 3, heating the substrate in the presence of nitrous oxide 18 to a temperature greater than or equal to 1000°C in a rapid thermal process for a duration greater than or equal to 1 minute, col. 8, lines 12-33;

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limitations from claim 23, a method of forming a silicon oxide layer on a substrate, comprising:

in fig. 2, providing a flow of tetraethylorthosilicate (TEOS) processing gas to a chamber housing the substrate 10;

providing a flow ozone to the chamber, col. 7, lines 52-63;

regulating the pressure of the chamber to a pressure in the range from about 200 torr to less than about 760 torr, col. 7, lines 10-50;

causing a reaction between the TEOS and the ozone to form a silicon oxide layer 16;

and, in fig. 3, heating the substrate 10 in the presence of nitrous oxide in a furnace to a temperature in the range from about 750°C to about 1000°C, col. 8, lines 12-33.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi as applied to claims 9-13, 17, 19, 20, 23 above, and further in view of Boyd et al, US Publication No. 2004/0018699 A1.

Jang does not specify using steam, but Boyd does. Boyd teaches the method of claim 15, wherein heating the substrate with oxide in the presence of nitrous oxide further comprises introducing steam into the furnace, p. 3, ¶ 34. Boyd gives motivation

in p. 1, ¶ 6. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Boyd's process with Jang's invention would have been beneficial because it enables forming gate quality BOX oxide region for SOI wafers.

***Allowable Subject Matter***

Claims 1-6, 8 are allowed, for the reasons given in paper 29 September 2005.

***Response to Arguments***

Applicant's arguments filed 28 December 2005 have been fully considered but they are not persuasive. For claims 17-19, applicant argues a 'furnace' is not used. Even though Adachi and now Jang do not use the terms, it is inherent by the definition inclosed.


Applicant's arguments with respect to claims 9-13, 20, 23 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
WILLIAM M. BREWSTER  
PRIMARY EXAMINER

18 January 2006

WB